

**National Climatic Data Center**

**DATA DOCUMENTATION**

**FOR**

**DATA SET 9644 (DSI-9644)**

**WORLD WEATHER RECORDS**

**December 23, 2002**

National Climatic Data Center  
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1. **Abstract:** The data set has been collected under the name "World Weather Records" (WWR) since the first series was published in a single volume in 1927. The 1981-90 decadal series is the eighth series of published data. As of November 1996, only three of these series: 1951-60, 1961-70 and 1971-80 have been digitally archived in DSI-9644. Other data sets at the National Climatic Data Center (NCDC), most notably the Global Historical Climate Network (GHCN: DSI-9100) have historical surface climatological data derived from the earlier, non-digital series of WWR.

#### Historical Perspective

In 1923, the International Meteorological Conference Committee, convened in Utrecht, Netherlands offered initial justification for the creation of WWR:

"...the conference thinks that publication of long and homogeneous series of observations in the form of monthly means of pressure, temperature and rainfall would be of the highest importance for the study of the general circulation of the atmosphere."

In response to the Conference's findings, the Smithsonian Institution of the United States sponsored the first series of WWR, edited by H. Helm Clayton and published in a single volume (1196 pages) in 1927. The publication included full period of record through 1920 of monthly means of temperature, pressure (station and sea-level) and precipitation for selected global stations. The volume was reprinted by the Smithsonian Institution (Smithsonian Miscellaneous Collections, Volume 79) in 1944.

The second series of WWR was published by the Smithsonian Institution (Smithsonian Miscellaneous Collections, Volume 90) as a single volume (646 pages) in 1934. This series covered the period 1921-30. In this series the precedent to include data back to the beginning of record for stations not previously published in WWR was established.

The third series of WWR was published by the Smithsonian Institution (Smithsonian Miscellaneous Collections, Volume 105) as a single volume (616 pages) in 1947. This series covered the period 1931-40.

In the fourth series of WWR, publication responsibility passed from the Smithsonian Institution to the U.S. Department of Commerce, Weather Bureau. Maintaining previous publication formats and elements, a single volume (World Weather Records, 1941-50; 1361 pages) was published by the Weather Bureau in Washington, DC in 1959.

In the fifth series, publication responsibility was tasked to the National Weather Records Center (predecessor of the NCDC) in Asheville, NC. This series marked the start of digital data archiving of WWR. In addition, the World Meteorological Organization (WMO) became involved, offering its sponsored collection of data included in the Weather Bureau's Monthly Climatic Data of the World (MCDW; DSI-3500) as a source for the 1951-60 series. WMO sponsorship of WWR was formalized in 1963. In 1960, the WMO Commission for Climatology recommended that WWR data be published in six separate volumes. This recommendation was adopted by the Weather Bureau and the six volumes were published between 1965 and 1968. Upon completion, the entire 1951-60 series was archived as the initial input into data set DSI-9644.

The sixth series of WWR were published by the National Climatic Center (predecessor to the NCDC) in six separate volumes between 1979 and 1985. With

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this series, one nation in each of the Regional Associations of the WMO was designated as a Regional Collector. The Regional Collector was responsible for collecting monthly pressure, temperature and precipitation data from nations within its region *specifically* for inclusion in WWR. This arrangement was agreed upon in 1973 by the WMO Commission for Special Applications of Meteorology and Climatology (CoSAMC). Upon completion, the entire 1961-70 series was added to DSI-9644.

The seventh series of WWR was published by the NCDC in six separate volumes between 1986 and 1994. Upon completion, the entire 1971-80 series was added to DSI-9644.

As of November, 1996, the eighth series of WWR was still being processed. Upon completion of each volume, that volume's 1981-90 data will be appended to DSI-9644.

## 2. Element Names and Definitions:

World Weather Records are provided as published volumes and in DSI-9644, the ASCII-formatted digital database.

Beginning with the 1951-60 series, World Weather Records have been published by the National Climatic Data Center (and its predecessors) in a six-volume set, with each volume roughly corresponding to a continent (with the exception of Volume 6):

<u>Volume</u>	<u>Geographic Coverage</u>	<u>WMO Regional Associations</u>
1	North America	4
2	Europe	6
3	West Indies, Central and South America	3,4
4	Asia	2
5	Africa	1
6	Islands of the World	1-7

All available data are both published in the volume sets and digitally archived through NCDC's tape library under DSI-9644. Elements from 1951-70 include monthly means of pressure (station and sea-level and temperature, as well as monthly total amounts of precipitation. Beginning with the 1981-90 series, values of mean maximum and minimum monthly temperatures were additionally included in DSI-9644. These temperature elements have not been published in the 1981-90 volume series, but their availability in DSI-9644 is indicated in each volume's index. Data in DSI-9644 are available from 1951 through the most recent full decade, contingent upon data collection and processing efforts.

No access software is available, but a standard 3rd-generation computer language like FORTRAN, COBOL, or C can be used to access the ASCII digital database, which is maintained in NCDC's tape library under DSI-9644.

Beginning with the 1961-70 series, the data are arranged in what is called the World Weather Records format, which is a 'flat', fixed-length ASCII sequential file. **ALL DSI-9644 DATA PRIOR TO THE 1961-70 SERIES ARE WRITTEN IN A FORMAT NOT COVERED BY THIS DOCUMENT.** (DOCUMENTATION IS AVAILABLE FOR THE EARLIER SERIES, BUT NOT IN DIGITAL FORM. PLEASE SEE THE TECHNICAL CONTACT IF YOU ARE INTERESTED.) The records are sorted first by COUNTRY and STATION DESIGNATOR

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grouping, then by RECORD DESIGNATOR and YEAR grouping (see definitions of these parameters below). There are separate header and data record formats, which are declared and arranged in the column format below:

Header records:

Variable	Type	Width	Start Column	End Column
(Reserved)			1	2
WMO NUMBER	Integer	5	3	7
RECORD DESIGNATOR	Integer	1	8	8
LATITUDE DEGREES	Integer	2	9	10
LATITUDE MINUTES	Integer	2	11	12
LATITUDE SYMBOL (N/S)	Character	1	13	13
LONGITUDE DEGREES	Integer	3	14	16
LONGITUDE MINUTES	Integer	2	17	18
LONGITUDE SYMBOL (E/W)	Character	1	19	19
COUNTRY NAME	Character	24	20	43
STATION NAME	Character	24	44	67
STATION HEIGHT	Integer	5	68	72
BAROMETER HEIGHT	Integer	6	73	78
(Reserved)			79	80
COUNTRY DESIGNATOR	Integer	4	81	84
STATION DESIGNATOR	Integer	5	85	89

Data records:

Variable	Type	Width	Start Column	End Column
(Reserved)			1	2
WMO NUMBER	Integer	5	3	7
RECORD DESIGNATOR	Integer	1	8	8
YEAR OF DATA	Integer	4	9	12
AVERAGE DESIGNATOR	Integer	1	13	13
JANUARY DATA VALUE	Integer	5	14	18
FEBRUARY DATA VALUE	Integer	5	19	23
MARCH DATA VALUE	Integer	5	24	28
APRIL DATA VALUE	Integer	5	29	33
MAY DATA VALUE	Integer	5	34	38
JUNE DATA VALUE	Integer	5	39	43
JULY DATA VALUE	Integer	5	44	48
AUGUST DATA VALUE	Integer	5	49	53
SEPTEMBER DATA VAL	Integer	5	54	58
OCTOBER DATA VALUE	Integer	5	59	63
NOVEMBER DATA VALUE	Integer	5	64	68
DECEMBER DATA VALUE	Integer	5	69	73
ANNUAL DATA VALUE	Integer	5	74	78
(Reserved)			79	80
COUNTRY DESIGNATOR	Integer	4	81	84
STATION DESIGNATOR	Integer	5	85	89

**Note:** Some data values may be blank-filled (missing). These values should be read as character data, i.e., 13(a5), rather than as integers, since a blank read as an integer has a value of zero. A description of each element follows.

#### Header Records

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## WMO NUMBER

This element is a five-digit integer that identifies a station. The Secretariat of the World Meteorological Organization, Geneva, Switzerland assigns such numbers to stations that are internationally recognized surface and/or upper air meteorological stations that contribute data to national and/or international data sets. Because of constant changes to this network of weather reporting observing stations, the WMO publishes WMO Volume A: Weather Reporting Observing Stations every six months. This publication is the authority on all WMO Number assignments.

Not all stations in the World Weather Records, have valid WMO numbers. In some cases, the WMO number is missing and this field is left blank. In this situation, stations should be identified within the decadal series using the NCDC-assigned STATION DESIGNATOR (see section 4.2) in conjunction with the COUNTRY DESIGNATOR. Occasionally, the nations submitting data for WWR include stations (primarily newly opened stations) that have not been formally recognized by the WMO. For confirmation of valid WMO numbers, the user is referred to WMO Volume A.

According to WMO Volume A, the following ranges of WMO numbers are valid in the following WMO Regional Associations:

<u>Regional Association</u>	<u>Lowest Number</u>	<u>Highest Number</u>
I: Africa	60000	69999
II: Asia	20000	20099
	20200	21999
	23000	25999
	28000	32999
	35000	36999
	38000	38999
	40350	48599
	48800	49999
	50000	59999
III: South America	80000	88999
IV: North and Central America	70000	79999
V: South-West Pacific	48600	48799
	90000	98999
VI: Europe	00000	19999
	20100	20199
	22000	22999
	26000	27999
	33000	34999
	37000	37999
	40000	40349
Stations in the Antarctic	89000	89999

## RECORD DESIGNATOR

This element is a one-digit integer that distinguishes between header and data

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records, and between the varying types of data records. It is always a '1' for header records, and one of the following for data records: '2' for mean station pressure (recorded in hectopascals to the nearest tenth (hPa)); '3' for mean sea-level pressure (hPa); '4' for mean air temperature (recorded in degrees Celsius to the nearest tenth (°C)); '5' for total amount of precipitation (recorded in whole millimeters (mm)); '6' for mean of the daily maximum air temperature (°C) (beginning 1981 in DSI-9644; not published in volume sets); and '7' for mean of the daily minimum air temperature (°C) (beginning 1981 in DSI-9644; not published in volume sets).

#### LATITUDE DEGREES/MINUTES/SYMBOL

These three elements make up the latitudinal location of a station. Degrees is a two-digit integer, varying from 00 to 59. Minutes is a two-digit integer, varying from 00 to 59. Symbol is a one-character field that distinguishes Northern Hemisphere ("N") from Southern Hemisphere ("S") locations.

#### LONGITUDE DEGREES/MINUTES/SYMBOL

These three elements make up the longitudinal location of a station. Degrees is a three-digit integer, varying from 000 to 180. Minutes is a two-digit integer, varying from 00 to 59. Symbol is a one-character field that distinguishes locations west of the Prime Meridian ("W") from locations east of the Prime Meridian ("E").

#### COUNTRY NAME

This element is the WMO-accepted short-form name of a given nation, as described in WMO Volume A, up to 24 characters. Between decadal series, country names may change for political reasons. If a change is submitted by the successor political entity, it will be published as submitted even if the station was a part of a predecessor political entity during the decadal series in question.

#### STATION NAME

This element is, for WMO numbered stations, the name of the station as described in WMO Volume A. For other stations, the name of the station is determined by the submitting nation or other source. All names are anglicized and are not accented. The first 24 characters of the station name are retained in this element.

#### STATION HEIGHT

This element is a five-digit integer that gives the height of a station above mean sea level to the nearest meter. Some stations have station heights below mean sea level (e.g., Alexandria/Nouzha, Egypt is at -2 meters)

#### BAROMETER HEIGHT

This element is a six-digit integer that gives the height of the base a station's barometer above mean sea level to the nearest tenth of a meter. The tenths place is implied.

#### COUNTRY/STATION DESIGNATOR

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These two elements, four-digit and five-digit integers, respectively, group stations by country nations and distinguish between stations in the same country. Their assignment is made by the NCDC in order to sort and keep track of WMO-numbered and non-numbered stations within a given decadal series. The assignment of station designators is made so that they can be used to sort countries and stations alphabetically by volume. As a result, they do not adhere to Federal Information Processing Standard (FIPS) assignments. Because new stations and country changes can yield differences in these elements between decadal series, these elements should be used with caution for inter-decadal compilation of data.

#### **Data records**

WMO NUMBER      See Header Records above

RECORD DESIGNATOR      See Header Records above

YEAR OF DATA

This element is the four-digit calendar year (e.g., 1995).

AVERAGE DESIGNATOR

This element is a one-digit integer that distinguishes decadal means (value of '1') with thirty-year Climatological Normals (CLINO) (value of '2') or other long-term averages. Data associated with a specific year has a blank AVERAGE DESIGNATOR.

DATA VALUES (JANUARY-DECEMBER AND ANNUAL)

These thirteen elements are five-digit integers that provide the monthly means (or, for the thirteenth element a mean of the monthly means for temperature and pressure or total for precipitation) for a given year, decadal average, or CLINO or long-term average. Note that the annual value is not computed unless all months of data are present. Also note that decadal averages for a given month are not computed unless at least five months of data are present for that month in the given ten-year period. If the value is not computed, this field remains blank.

Published values of these elements for temperature and pressure include a decimal place, but in DSI-9644 values are provided in tenths with an implied decimal point. Thus, a pressure value of 10145 is really 1014.5, 9975 is really 997.5, and so forth.

The total amount of precipitation is provided solely in integer form. As a result, zero and trace values are distinguished (both in DSI-9644 and the volume sets) with a zero in the fourth column and a zero in both the fourth and fifth columns, respectively.

Blank values imply missing data.

COUNTRY DESIGNATOR      See Header Records above

STATION DESIGNATOR      See Header Records above

**3.    Start Date:** 19510101. However, there are potentially a limited number of stations that were added to WWR in either the 1951-60, 1961-70 or 1971-80

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series that may have monthly data back to their beginning of record (which could precede January, 1951). If data is not received in time for publication in a decadal series, it is retained for publication in the next decadal series. Corrections are published as errata in the next decadal volume in which that country is included.

4. **Stop Date:** Ongoing. Current through the most recent full decade, contingent upon data collection and processing efforts.

5. **Coverage:** Global.

- a. Southernmost Latitude: 90S
- b. Northernmost Latitude: 90N
- c. Westernmost Longitude: 180W
- d. Easternmost Longitude: 180E

6. **How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.  
Phone: 828-271-4800  
FAX: 828-271-4876  
E-mail: [NCDC.Orders@noaa.gov](mailto:NCDC.Orders@noaa.gov)

7. **Archiving Data Center:**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001  
Phone: (828) 271-4800.

8. **Technical Contact:**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001  
Phone: (828) 271-4800.

9. **Known Uncorrected Problems:** Data Extraction. When data is not provided by a nation in a timely fashion, the missing data is augmented from other sources (such as DSI-9100, DSI-3500 or other miscellaneous sources). When such sources are utilized a notation is made in the station notes section of the appropriate decadal volume. These alternative sources, to an extent, derive their data from the Global Telecommunications System (GTS). Unfortunately, transmission difficulties can result in an elevated number of missing months in the augmented data. This makes the separate, direct receipt of monthly data from WMO-member nations vital.

10. **Quality Statement:** This data set has undergone limited quality control. The quality control consists of:

- 1. Station pressure check: values must always be less than or equal to sea-level pressure unless the barometer is below mean sea level.
- 2. Static limits checks are applied to all values; values exceeding the

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following thresholds are flagged as suspect and must be examined and corrected.

Pressure: < 925 hPa or > 1050 hPa

Temperature: < -40 °C or > 40 °C

Precipitation: < 0 mm or > 3500 mm

3. If annual/decadal means are provided by the submitting country, they are compared against annual/decadal means calculated from the twelve monthly values provided. If the absolute value of the difference between these two values is more than 0.1, the value is flagged as suspect and must be examined and corrected.
4. Mean and CLINO values are examined for their compliance to period of record requirements. Mean values require at least five out of ten years for a decadal calculation and CLINO values require at least a thirty-year consecutive period of record.

**11. Essential Companion Datasets:** None. The data set published in DSI-9644 is, to varying degrees, documented by a nation's submission of station notes. These notes are published in World Weather Records volumes.

**12. References:** No information provided with original documentation.

Appendix A, beginning on the next page, is a copy of the actual instructions issued by the WMO, used in the last data collection.

## APPENDIX A: World Meteorological Organization Instructions

Our ref: M/WWR-I

GENEVA, 25 June 1996

Annex: 1

Subject: Collection of data from Region I for publication in  
World Weather Records 1981-1990

Action required: Submission of data to the appropriate regional co-  
ordinating centre as indicated below at the earliest  
convenience **but not later than 31 December 1996**

Dear Sir/Madam,

You will recall that data from Members of RA I were collected in 1988 for publication in the World Weather Records 1971-1980 series within the framework of a WMO-sponsored long-term project (reference WMO circular letter No. M/AF.CLW (AFR-505) of 26 February 1988). The volume containing these data, i.e. Volume 5 (Africa), was published and distributed by the National Climatic Data Center of the USA (NCDC) in 1993. I wish to take this opportunity to thank, on behalf of WMO, all Members which contributed to the project.

Arrangements have now been made for the preparation and publication of the World Weather Records 1981-1990 series following the procedure used for the preceding volumes in most WMO Regions, whereby a regional co-ordinating centre undertook to collect and edit the relevant data from the Members of the Regional Association for onward transmission to the NCDC for publication.

In Region I, in view of the large number of Members of RA I, the task of data collection is shared by two volunteering Members: Kenya and Senegal in such a way that Kenya, using the Regional Specialized Meteorological Centre (RSMC) in Nairobi, will collect the data from Members in Central, Eastern and Southern Africa, and Senegal will use the

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RSMC in Dakar for collection from Members in Northern and Western Africa,  
as indicated below:

To: Permanent Representatives of Members of Regional Association I (AFR-)

cc: President and vice-president of Regional Association I

President and vice-president of CCI

Permanent Representatives of Kenya and Senegal (for information)

Director of the National Climatic Data Center of the USA

**Dakar**

Algeria

Benin

Burkina Faso

Cameroun

Cape Verde

Central African Republic

Chad

Congo

Côte d'Ivoire

Gabon

Gambia

Ghana

Guinea

Guinea-Bissau

Liberia

Libyan Arab Jamahiriya

Mali

Mauritania

Morocco

Niger

Nigeria

Portugal

Sao Tome and Principe

Senegal

Sierra Leone

Spain

Togo

Tunisia

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United Kingdom  
Zaire

**Nairobi**

Angola  
Botswana  
Burundi  
Comoros  
Djibouti  
Egypt  
Eritrea  
Ethiopia  
France  
Kenya  
Lesotho  
Madagascar  
Malawi  
Mauritius  
Mozambique  
Namibia  
Rwanda  
Seychelles  
Somalia  
South Africa  
Sudan  
Swaziland  
Uganda  
United Republic of Tanzania  
Zambia  
Zimbabwe

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I therefore invite you to prepare the data from your country together with station notes, following the instructions formulated by NCDC and reproduced in the annex to this letter. These instructions constitute a revised and expanded version of those used in the 1961-1970 data collection. However, the formats and procedures to be used in presenting the data remain for the most part unchanged; the differences from the presentation of data relating to the 1961-1970 are summarized in the following points:

- (a) The range of acceptable formats for transferring data has been expanded to include diskettes from CLICOM. If this system is used, the data are to be exchanged on ASCII diskettes using the standard CLICOM keying format for monthly data;
- (b) Following a long-term need for enhancing the international climate record, the types of data to be exchanged have been expanded to include the mean daily maximum temperature for the month and the mean daily minimum temperature for the month (as defined in the Guide to Climatological Practices). These data will be included in the digital record as supplementary data and also used as a quality check of monthly mean temperature.

I should like to emphasize the need to take the utmost care in the preparation of the material, adhering strictly to the formats indicated and providing all the required information relating to the stations. The station notes are considered an essential part of the whole presentation and should be prepared concurrently with the data listings.

To facilitate the early publication of data from Africa in the World Weather Records 1981-1990 series, I should be grateful if you would send your contribution at your earliest convenience, but not later than **31 December 1996** to the appropriate co-ordinating centre. The addresses of the co-ordinating centres are given below:

Météorologie nationale

Ministère du Tourisme et des  
Transports Aériens  
B.P. 8257

Kenya Meteorological  
Department

Attn. Mr Richard S. Masika  
P.O. Box 30259  
NAIROBI

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DAKAR-YOFF  
Senegal

Kenya

Yours faithfully,  
(G.O.P. Obasi)

Secretary-General

**WORLD METEOROLOGICAL ORGANIZATION**

M/WWR-I, ANNEX

**INSTRUCTIONS FOR PREPARATION OF STATION NOTES AND DATA  
TO BE PRINTED IN WORLD WEATHER RECORDS (WWR), 1981-1990**

**1. Station Notes**

To permit making the greatest possible use of your climatic data, please provide notes for all stations sent. The notes should include the following:

- (a) Historical record of location, elevation, and instrumentation;
- (b) Times of the observations used in computing means and times when precipitation is measured;
- (c) Formulas used in computing means;
- (d) Height of the barometer above mean sea level and heights of the thermometer and rain gauge above ground;
- (e) Period of record of Climatological Normal (CLINO) or other long-period average values.

A sample of Station Notes is included at the end of the text of these instructions.

**2. Data**

The data elements to be entered for the period 1981-1990 are monthly and annual means of station pressure, sea level pressure, temperature, maximum temperature and minimum temperature, and monthly and annual totals of precipitation. These data are needed for the stations published in previous issues of **World Weather Records**. Additional stations are welcome but for those please include data from the earliest record available through 1990.

Beginning with the 1981-1990 decade, the data element types have been expanded to include monthly means of maximum and minimum temperature. These data will be included in the digital record as supplementary data

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and also used as quality check of monthly mean temperature. Please include data from the earliest record available through 1990 for all stations for these additional data types.

### 3. **Formats**

Two basic formats may be used. These are (i) the standard format described in detail below, which has been used in the collection process for the 1961-1970 WWR series, and (ii) the CLICOM ASCII export format (exporting the data from CLICOM onto computer diskettes using ASCII format).

The standard WWR format layout for giving the data relating to one station is divided into two main parts. The first format (for the 1st record) provides for a detailed station identification record. The second format relates to the record of the data for one element (together with the station index number) and can be further sub-divided into three parts as follows:

- Ten records to contain the monthly and annual means or totals for the years 1981 to 1990 (one record for each year);
- One record to contain the decadal average for 1981-1990;
- One record to contain the CLINO or other long-period average, if such data are available.

Full descriptions of the first and second formats are given in sub-paragraphs (a) and (b), respectively, below:

#### **(a) First format**

This format can be broken down into the following fields:

- (i) Field 1 (characters 1 and 2) is used for internal sort processes. The use of this field is optional and the content is usually blank;
- (ii) Field 2 (characters 3 to 7) is the WMO station index number. It is composed of the block number (characters 3 and 4) and the station number (characters 5 to 7);
- (iii) Field 3 (character 8) is a designator of record. This is always "1" for the identification record;
- (iv) Field 4 (characters 9 to 19) contains the co-ordinates of the station. The latitude (characters 9 to 13, right justified) is given by four digits (two for degrees and two for minutes) and the letter N or S, as appropriate. The longitude (characters 14 to 19, right justified) is given by five digits (three for degrees and two for minutes) and the letter E or W, as appropriate;

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- (v) Field 5 (characters 20 to 43, left justified) is the country name in English;
- (vi) Field 6 (characters 44 to 67, left justified) is the station name in English;
- (vii) Field 7 (characters 68 to 72, right justified) is the height of the ground at the station above mean sea level in metres at the end of 1990. (If the ground at the station is below mean sea level, character 68 shall be "-" (minus));
- (viii) Field 8 (characters 73 to 78, right justified) is the elevation of the station (i.e. the height of the barometer above mean sea level) in tenths of a metre, at the end of 1990. (If the barometer at the station is below mean sea level, character 73 shall be "-" (minus).)

**Notes:** (1) Characters 79 and 80 are not used.

(2) The additional characters 81 to 89 may be used by the regional co-ordinating centre to give a "WWR sort number" for sorting purposes only. This field is optional.

Please indicate in the Station Notes all changes (and the dates of these changes) that occurred in the period 1981-1990 in the WMO station index number, co-ordinates, names, and heights referred to in the first format.

**(b) *Second format***

This format can be broken down into the following fields:

- (i) Field 1 (characters 1 and 2) is used for internal sort processes. The use of this field is optional and the content is usually blank;
- (ii) Field 2 (characters 3 to 7) is the WMO station index number. It is composed of the block number (characters 3 and 4) and the station number (characters 5 to 7);
- (iii) Field 3 (character 8) is the element designator code. The following codes should be used:

"2" = Mean pressure at station in tenths of a hectopascal

"3" = Mean of the pressure reduced to mean sea-level in tenths of a hectopascal

"4" = Mean air temperature in tenths of a degree Celsius

"5" = Total amount of precipitation in tenths of a millimetre

"6" = Mean of the daily maximum air temperatures in tenths of a degree Celsius

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"7" = Mean of the daily minimum air temperatures in tenths of a degree Celsius

(Detailed instructions for entering the data are given in sub-paragraph (vi) below);

(iv) Field 4 (characters 9 to 12) is the year (one of 1981 to 1990 or earlier for new stations) to which the data relate. (See also sub-paragraph (v) below);

(v) Field 5 (character 13) is the designator of multi-year average values. The following codes are used:

no entry or blank = yearly data (records 2-11)  
"1" = decadal average (record 12)  
"2" = CLINO or other long-period average (record 13)

Please indicate in the Stations Notes the time periods to which CLINO or other long-period averages relate. When "1" or "2" is used in the field, enter "1990" in field 4;

(vi) Field 6 (characters 14 to 78) is composed of 13 sub-fields (twelve monthly and one annual mean or total) as follows:

Characters	14 to 18:	Value for January		
"	19 to 23:	"	"	February
"	24 to 28:	"	"	March
"	29 to 33:	"	"	April
"	34 to 38:	"	"	May
"	39 to 43:	"	"	June
"	44 to 48:	"	"	July
"	49 to 53:	"	"	August
"	54 to 58:	"	"	September
"	59 to 63:	"	"	October
"	64 to 68:	"	"	November
"	69 to 73:	"	"	December
"	74 to 78:	"	"	year

The following rules apply for field 6:

- (1) The values shall be given in the unit indicated in sub-paragraph (b) (iii) above and shall be right justified within each sub-field. If the tenth figure of a value is not available, the corresponding character shall be coded "0" (zero). Decimal points are implied (i.e., 1014.1 is entered 10141).
- (2) If the mean temperature is negative, the first character of the corresponding sub-field shall be coded "-" (minus).
- (3) If the total amount of precipitation is zero, the fourth character of the corresponding sub-field shall be coded "0" (zero). If the total amount of precipitation is "trace"

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(i.e. greater than zero but smaller than one-half tenth of a millimetre), the fourth and the fifth character of the corresponding field shall be coded "00" (double zero).

- (4) If a monthly or yearly value is missing, the corresponding sub-field should be left blank.

**Note:** Concerning the use of characters 79 to 89, see Notes (1) and (2) in paragraph 3 (a) above.

If data are missing for an entire year, fields 1-5 should be encoded, (as well as characters 81 to 89, by the regional co-ordinating centre, if applicable), with field 6 left blank.

Samples of the WWR formats (with headings and notes in English only) are attached to these instructions.

**Note:** For practical reasons, the samples used in the preceding decade (filled in with data for the decade 1961-1970 from one station) have been reproduced. These samples contain references to punch cards and related operations, which should now be disregarded.

#### **4. Media for providing the data**

- (a) Due to limited funds for this project, the most preferred data carrier is magnetic tape or ASCII diskettes. The data can also be forwarded in the form of lists.
- (b) If a magnetic tape is used, it must be COBOL compatible and the following conditions must be observed:

- Density	800, 1600, or 6250 BPI
- Mode	EBCDIC or ASCII
- Blocking	89/890*
- Number of tracks	9
- Parity	Odd
- Labeling	None

\* Blocked 10 records per block.

**Note:** Tape will contain no tape marks except two END OF FILES (EOF's) at the end of the data on each tape.

#### **5. Sending of the data**

The Members of RA I should send WWR data and Station Notes to the appropriate co-ordinating centre as indicated in the circular letter, not later than 31 December 1996.

#### **Sample of Station Notes**

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## STATION NOTES

## TRINIDAD AND TOBAGO (2 stations)

**General:**

All observation hours were in local time. A total of 24 hourly observations per day were used in computing the means of temperature and pressure except at Crown Point. At this station, part time operation existed during June to December 1980; January 1976; 1977, and 1978; February, March, April 1976; and for February, March, and April 1978. Observation hours during these periods were 0700 to 2300 hours or 0800 to 2200 hours.

At Piarco, the period of record of CLINO values for sea level pressure and temperature was 1946-1975. For precipitation it was 1946-1980. No CLINO exists for Crown Point since past records begin only in 1970.

**Pressure:**

Pressure was measured by a Kew Pattern barometer until 1974 after which a precision Aneroid type was used. Heights of the barometers were 13.4 meters at Piarco and 6.7 meters at Crown Point.

**Temperature:**

Thermometers, housed in a standard Stevenson Screen, were 1.2 meters above ground at both stations.

**Precipitation:**

Rainfall was measured by a pot gauge. A Tilting - Siphon rain recorder adjusted the pot gauge. Rainfall was measured four times daily at 0200, 0800, 1400, and 2000 hours local time at both stations except during part time operations at Crown Point. Heights of the rain gauges were .3 meters at Piarco, and 3 meters at Crown Point.

## URUGUAY (13 stations)

**General:**

CLINO values correspond to the period 1951-80 for precipitation and 1946-1980 for other elements. Rain gauges and thermometers were located 1.5 meters above the ground.

**Pressure and Temperature:**

The monthly pressure and temperature values were both computed from the equation:

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1/10 (00+03+06+09+12+15+18+21 hours GMT + Mean Max + Mean Min)

**Precipitation:**

The daily values were measured at 0900 hours GMT.

**NORTH AMERICA**

TORONTO, ONT.

CANADA

WMO Number: 71266

Latitude: 43 ° 40 ' N

Longitude: 079 ° 24 ' W

Elevation: 113 meters

**Station Pressure (in millibars)**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MEAN
1981	994.9	995.9	990.5	994.0	993.8	991.7	995.5	995.8	994.2	997.9	994.9	993.8	994.4
1982	993.9	1000.5	995.6	994.3	996.3	992.7	994.9	996.0	997.2	998.3	998.2	997.4	996.3
1983	997.1	997.0	991.8	990.9	992.5	995.5	994.5	995.9	997.0	999.5	991.4	996.9	995.0
1984	998.9	993.3	995.2	991.9	992.7	993.8	994.1	994.6	998.6	1000.7	996.9	996.8	995.6
1985	990.4	996.6	995.7	993.4	991.7	992.1	993.7	997.2	999.0	999.1	998.4	992.4	995.0
1986	994.5	994.2	995.0	993.2	994.2	993.9	994.2	996.1	997.1	998.1	999.3	999.1	995.7
1987	992.6	999.2	997.8	993.4	997.1	992.6	994.7	995.4	994.5	996.8	997.8	993.4	995.4
1988	998.7	994.7	995.7	989.7	994.6	994.1	995.2	994.1	996.5	994.6	992.2	996.0	994.7
1989	996.2	1000.2	999.9	994.9	993.1	994.2	996.7	994.8	998.4	996.8	990.2	996.2	996.0
1990	992.0	997.4	1000.7	994.1	992.7	991.6	996.1	997.1	994.9	995.3	995.4	997.1	995.4
MEAN	994.9	996.9	995.8	993.0	993.9	993.2	995.0	995.7	996.7	997.7	995.5	995.9	995.4
CLINO	994.8	995.4	994.5	993.4	993.8	993.4	994.2	995.2	996.4	996.4	994.9	995.2	994.8

**Temperature (in degrees Celsius)**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MEAN
1981	-10.1	-2.0	0.1	7.6	11.7	17.3	20.6	19.4	14.3	6.5	3.5	-2.8	7.2
1982	-10.0	-7.5	-2.0	4.7	14.3	15.2	20.9	17.3	14.8	9.7	3.9	0.8	6.8
1983	-4.0	-3.0	0.6	5.5	10.1	18.3	22.3	21.0	16.7	8.9	3.3	-6.3	7.8
1984	-9.6	-1.4	-4.5	7.2	10.3	18.1	19.8	21.1	13.9	10.3	2.7	-0.1	7.3
1985	-8.3	-5.7	0.3	7.3	13.1	15.6	19.6	19.4	17.0	9.4	3.4	-4.6	7.2
1986	-5.5	-6.0	0.6	7.6	14.3	16.4	21.0	18.4	14.7	8.7	1.6	-1.1	7.6
1987	-4.5	-5.7	1.8	8.8	14.7	19.6	22.6	19.6	15.5	7.0	3.4	-0.2	8.6
1988	-4.5	-6.7	-0.7	5.9	13.9	17.7	22.9	21.4	15.5	7.2	4.5	-2.8	7.9
1989	-2.1	-6.3	-2.0	5.1	12.9	18.4	21.4	19.6	15.7	9.8	1.9	-10.0	7.0
1990	-0.7	-3.5	0.7	8.3	11.6	18.7	20.9	20.3	15.3	9.4	4.6	-0.9	8.7
MEAN	-5.9	-4.8	-.5	6.8	12.7	17.5	21.2	19.8	15.3	8.7	3.3	-2.8	7.6
CLINO	-6.7	-6.1	-0.8	6.0	12.3	17.4	20.5	19.5	15.2	8.9	3.2	-3.5	7.2

**Precipitation (in millimeters)**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1981	11.9	66.2	17.8	49.7	58.1	61.5	66.6	128.5	103.3	134.9	57.8	34.0	790.3
1982	54.3	28.3	64.8	43.1	45.1	112.5	31.1	120.1	128.9	43.5	94.8	80.9	847.4
1983	33.7	40.6	77.3	83.2	99.5	33.0	18.3	112.2	54.9	71.8	89.1	82.0	795.6
1984	30.2	59.0	59.5	58.7	102.8	48.1	63.3	63.8	74.7	26.1	69.9	61.3	717.4
1985	76.6	83.1	78.6	33.1	75.9	37.3	91.5	152.5	57.6	52.3	161.8	35.9	936.2

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1986	26.5	32.0	48.8	54.0	75.2	67.4	122.3	146.2	212.3	54.8	44.4	67.3	951.2
1987	56.6	14.8	44.2	49.8	29.6	68.3	108.1	52.3	108.0	48.1	83.4	47.4	710.6
1988	21.5	64.6	23.6	55.2	39.6	25.0	109.7	37.2	70.6	67.4	58.1	31.5	604.0
1989	25.9	19.0	37.1	41.1	79.2	94.7	70.4	39.6	44.1	76.2	78.5	23.8	629.6
1990	36.7	76.9	28.7	53.0	86.6	69.4	68.4	112.6	42.8	87.8	39.6	112.8	815.3
MEAN	37.4	48.5	48.0	52.1	69.2	61.7	75.0	96.5	89.7	66.3	77.7	57.7	779.8
CLINO	45	45	56	64	66	68	76	84	74	63	70	65	780

## ALPHABETICAL INDEX - ALL STATIONS OR ELEMENTS

## CODE OF DATA PUBLISHED AND IN DIGITAL DATABASE

P: Pressure at Station Level      T: Temperature  
M: Pressure at Sea Level          R: Precipitation

## CODE OF DATA AVAILABLE ONLY IN DIGITAL DATABASE

X: Mean Maximum Temperature      N: Mean Minimum Temperature

Name	Number	Code	WMO	Data	Page
			Notes	Data	
ABILENE, TEXAS	72266	PMTRXN	20	185	
ACAPULCO, GRO.	76805	PMTRXN	19	154	
ADAK	70454	TRXN	7	47	
ALBANY, NEW YORK	72518	PMTRXN	20	186	
ALBUQUERQUE, NEW MEXICO	72365	PMTRXN	20	187	
ALERT, N.W.T.	71082	PMTRXN	12	71	
ALPENA, MICHIGAN	72639	PMTRXN	20	188	
ANCHORAGE	70273	PMTRXN	7	48	
ANNETTE ISLAND	70398	PMTRXN	7	49	
ARMSTRONG A, ONT.	71841	TRXN	12	72	
ASHEVILLE, N. CAROLINA	72315	PMTRXN	20	189	
ATLANTA, GEORGIA	72219	PMTRXN	20	190	
BAGOTVILLE A, QUE.	71727	PMTRXN	12	73	
BAKER LAKE A, N.W.T.	71926	PMTRXN	12	74	
BARKERVILLE, B.C.		TRXN	12	75	
BARROW	70026	PMTRXN	7	50	
BARTER ISLAND	70086	PMTRXN	7	51	
BEEVILLE, TEXAS		TRXN	20	192	
BETHEL	70219	PMTRXN	7	52	
BIG TROUT LAKE, ONT.	71848	PMTRXN	12	76	
BIRMINGHAM, ALABAMA	72228	PMTRXN	20	193	
BISMARCK, NORTH DAKOTA	72764	PMTRXN	20	194	
BLOCK ISLAND, RHODE IS.	72505	TRXN	20	195	
BLUE HILL, MASSACHUSETTS		TRXN	20	196	
BOISE, IDAHO	72681	PMTRXN	20	197	
BOZEMAN, MONTANA		TRXN	20	198	
BROWNSVILLE, TEXAS	72250	PMTRXN	20	199	
BURLINGTON, VERMONT	72617	PMTRXN	20	200	
CAIRO, ILLINOIS		TRXN	20	201	
CALGARY INT'L A, ALTA.	71877	PMTRXN	12	77	
CALHOUN, LOUISIANA		TRXN	20	202	
CAMBRIDGE BAY A, N.W.T.	71925	PMTRXN	12	78	
CAMPECHE, CAMP.	76695	PMTRXN	19	155	
CAPE HATTERAS, N CAROLINA	72304	PMTRXN	20	203	
CD OBREGON, SON.	76258	PMTRXN	19	156	
CHARLESTON, S. CAROLINA	72208	PMTRXN	20	204	
CHARLESTON, WEST VIRGINI	72414	PMTRXN	20	205	
CHARLOTTETOWN A, P.E.I.	71706	PMTRXN	12	79	
CHATHAM A, N.B.	71717	PMTRXN	12	80	
CHATHAM, MICHIGAN		TRXN	20	207	
CHETUMAL, Q.ROO	76750	PMTRXN	19	157	
CHICAGO, ILLINOIS	72534	TRXN	20	208	

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CHICOUTIMI UNIVERSITE, Q		TRXN	12	81
CHIHUAHUA, CHIH.	76225	PMTRXN	19	158
CHURCHILL A, MAN.	71913	PMTRXN	12	82
CINCINNATI, OHIO	72421	PMTRXN	20	209
CLYDE A, N.W.T.	71090	PMTRXN	12	83
COATZACOALCOS, VER.	76741	PMTRXN	19	159
COLD BAY	70316	PMTRXN	7	53
COLUMBIA, SOUTH CAROLINA	72310	PMTRXN	20	210
COLUMBUS, OHIO	72428	PMTRXN	20	211
CONCORDIA, KANSAS	72458	PMTRXN	20	212
COPPERMINE A, N.W.T.	71938	PMTRXN	12	84
CORAL HARBOUR A, N.W.T.	71915	PMTRXN	12	85
COTTONWOOD, SOUTH DAKOTA		TRXN	20	213
CRETE, NEBRASKA		TRXN	20	214
DALLAS/FORT WORTH, TEXAS	72259	PMTRXN	20	215
DAVIS, CALIFORNIA		TRXN	20	217
DAWSON A, Y.T.	71966	PMTRXN	12	86
DENVER, COLORADO	72469	PMTRXN	20	218
DES MOINES, IOWA	72546	PMTRXN	20	219
DEVILS LAKE, N. DAKOTA	72757	TRXN	20	220
DICKINSON, NORTH DAKOTA		TRXN	20	221
DODGE CITY, KANSAS	72451	PMTRXN	20	222
DULUTH, MINNESOTA	72745	PMTRXN	20	223
EASTPORT, MAINE	72608	TRXN	20	224
EDMONTON INT'L A, ALTA.	71123	PMTRXN	12	88
EDMONTON MUNI. A, ALTA.	71879	PMTRXN	12	89
EL PASO, TEXAS	72270	PMTRXN	20	225
ELY, NEVADA	72486	PMTRXN	20	226
EUREKA, CALIFORNIA	72594	TRXN	20	227
EUREKA, N.W.T.	71917	PMTRXN	12	90
FAIRBANKS	70261	PMTRXN	7	54
FAIRBANKS UNIV. EXP STA		TRXN	7	55
FAYETTEVILLE, ARKANSAS		TRXN	20	228
FORT GOOD HOPE A, N.W.T.		TRXN	12	91
FORT MCMURRAY A, ALTA.	71932	PMTRXN	12	92
FORT NELSON A, B.C.	71945	PMTRXN	12	93
FORT SIMPSON A, N.W.T.	71946	PMTRXN	12	94
FORT SMITH A, N.W.T.	71934	PMTRXN	12	95
FREDERICTON A, N.B.	71700	PMTRXN	12	96
FRESNO, CALIFORNIA	72389	PMTRXN	20	229
GALVESTON, TEXAS	72242	TRXN	20	231
GANDER INT'L A, NFLD.	71803	PMTRXN	12	97
GENEVA, NEW YORK		TRXN	20	232
GOODWELL, OKLAHOMA		TRXN	20	233
GOOSE A, NFLD.	71816	PMTRXN	12	98
GORE BAY A, ONT.	71733	PMTRXN	12	99
GRAND CANYON, ARIZONA	72378	TRXN	20	234
GREEN BAY, WISCONSIN	72645	PMTRXN	20	235

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